

Appl. No. 10/822,207
AMENDMENT FILED CONCOMITANT WITH RCE

REMARKS/ARGUMENTS

Consideration is requested of the AMENDMENT FILED AFTER FINAL but previously not considered.

The Examiner in the Advisory Action noted that Applicants' allegation that the ferromagnetic material is not covered by a stationary nonmagnetic material is not found persuasive. The Examiner referred to the disclosure of the prior art (Col. 8, line 35).

According to the invention as claimed in claim 1, the electromagnetic coil in the pilot clutch is surrounded with stationary ferromagnetic material over its rear, inner peripheral and outer peripheral sides, namely over its sides other than its magnetic force exerting side which is its front side. Furthermore, the claim is clarified to require that the stationary ferromagnetic material is covered with stationary nonmagnetic material made separately from the stationary ferromagnetic material. (The matter that stationary nonmagnetic material is made separately from the stationary ferromagnetic material is supported in paragraph [0021] of the specification.)

The requirements of the present invention are not arbitrary design choices. The present inventors ascertained through

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several simulations that surrounding an electromagnetic coil with a ferromagnetic material increases the force of attraction of the electromagnetic coil to a pilot clutch. According to these simulations, the electromagnetic force of one coil which is surrounded with stationary ferromagnetic material over its rear, inner peripheral and outer peripheral sides is about twice as strong as that of a comparable coil which is surrounded with stationary ferromagnetic material over its rear and outer peripheral sides or only its inner peripheral side.

In contrast to the present invention, in Hara et al. , the yoke 43 made of low-carbon steel (ferromagnetic material) surrounds the rear and inner peripheral sides of the electromagnetic coil 63 but not the outer peripheral side of the coil, so that the electromagnetic force of the coil is much weaker than that of the present invention case.

In the invention as claimed in claim 1, the stationary ferromagnetic material is covered with stationary nonmagnetic material made separately from the stationary ferromagnetic material, e.g., by molding. This provides the practical advantage that the stationary nonmagnetic material can be easily made thicker so as to confine lines of electromagnetic force within the nonmagnetic material, without the result that the electromagnetic force exerted from the coil towards the retaining

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ring of the pilot clutch is strengthened.

As indicated by the Examiner, at column 8, line 35 of Hara et al., there is a description "the hardened layer K is non-magnetic".

However, as described in column 6, lines 56-60 of Hara et al., the hardened layer K is formed on each of the facing surfaces of the rear housing 31b and the yoke 43 by means of soft-nitriding treatment. It is impossible to freely make the layer K appreciably thick so as to confine lines of electromagnetic force within the layer K by soft-nitriding treatment.

Furthermore, as described in column 6, line 65 to column 7, line 6, the thickness and area of the hardened layer K is set in such a manner that the formation of the hardened layer K does not greatly deteriorate the magnetic properties of the rear housing 31b and the yoke 43. That is, the hardened layer K does not aim at confining lines of electromagnetic force within the layer K, so that the electromagnetic force exerted from the coil 63 towards the retaining ring (armature) 62 of the pilot clutch is not strengthened.

Since Hara et al. fails to show each element of claim 1 (amended) as discussed above, claim 1 (amended) cannot be anticipated by Hara et al.

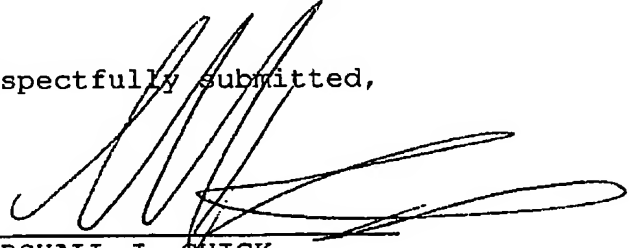
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The obviousness rejections over Hara et al. also are unsupported by Hara et al. As discussed above, Hara is missing critical features of the invention for the desired results. Furthermore, these features are not obvious. Thus, Hara et al. does not render claims 2, 4 and 6-8, which depend from claim 1 and include all of the features of claim 1, obvious.

In view of the above, it is submitted that the present invention is not shown or suggested by the cited art. Withdrawal of the rejections and allowance of the application are respectfully requested.

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